

Awareness of cervical cancer, human papilloma virus (HPV) and HPV vaccination among women in a cancer screening, early diagnosis and education center

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Abstract

Aim: This study was conducted to assess the awareness of women about cervical cancer and human papilloma virus (HPV) and to evaluate their HPV DNA test results.

Materials and Methods: This analytical cross-sectional study was conducted in 250 women who applied to Cancer Early Diagnosis Screening and Training Center (KETEM) at Konya Training and Research Hospital of Health Sciences University. A questionnaire prepared by the researchers was applied to determine the women's sociodemographic characteristics, cervical cancer and HPV knowledge levels.

Results: The mean age of the women was 47.7 ± 7.5 years old. When the smear results of the women included in the study are examined, HPV was positive in 3.2% (n=8). Participants with higher education levels had significantly higher Pap smear test knowledge and performed more Pap smear tests than those who had lower education levels ($p < 0.001$). Participants with higher monthly income had significantly higher levels of HPV vaccination knowledge ($p = 0.014$). Women who had regular gynecological examinations, had higher screening test knowledge and had Pap smear tests more than those who were not screened regularly ($p < 0.001$). Participants who know what is a Pap smear test, had a significantly higher HPV vaccine knowledge ($p < 0.001$). Women who had higher education levels had a significantly higher knowledge level about HPV-related lesions ($p < 0.001$).

Conclusions: Pap smear test rates, awareness and knowledge regarding HPV, cervical cancer and HPV vaccine were appeared to be very low in our study. It is possible to reduce disorders caused by HPV infection and cervical cancer incidence by improving awareness for cervical cancer and HPV infection, generalizing use of preventive measures, and extending participation to screening programs and HPV vaccination.

Keywords: Cervical cancer; early diagnosis of cancer; pap smear test; virus

INTRODUCTION

The cervical cancer is fourth common cancer in women worldwide and third most common gynecological cancer after endometrial and ovarian cancers. Annually, 528,000 new cases are diagnosed as cervical cancer and 266,000 women die due to cervical cancer (1). In Turkey, it is tenth most common cancer among women and age-adjusted cervical cancer incidence is 4: 100,000 (2).

Owing to cytology-based screening programs, cervical cancer incidence and cervical cancer-related mortality have been decreased dramatically, particularly in developed countries (3). The primary cause is oncogenic Human papillomavirus (HPV) species in cervical cancer. The HPV is an oncogenic DNA virus identified as etiological agent in cancers of cervical, anogenital, skin, upper respiratory

tract and upper gastrointestinal tract (4,5). It is a sexually-transmitted infection (6). Among approximately 200 HPV strains, HPV 16 and HPV 18 are related with 70% of all cervical cancer cases worldwide (7). The Pap smear test is a screening method detecting changes in cervix at cell level and primary method for cervical cancer prevention. Owing to successful implementation of screening programs, cervical cancer can be detected before progression to a point requiring surgery in developed countries. The cervical cancer has become tenth most common cancer in developed countries when compared to developing countries where it is second or third most common cancer (8,9).

In recent studies, it has been reported that HPV vaccines provide an effective protection against HPV-related

Received: 10.10.2020 **Accepted:** 02.12.2020 **Available online:** 21.09.2021

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cervical premalignant lesions for at least 5 years. There are two types of HPV vaccines in use: quadrivalent (HPV 6, 11, 16 and 18) and bivalent (HPV 16 and 18) HPV vaccines. In conclusion, HPV vaccination provides a major advantage in protection against cervical cancer which is strongly related to a viral agent (9).

Although cervical cancer does not comprise a severe disease burden in Turkey, it is screened by cervical smear since 1992 in accordance to recommendations of World Health Organization (WHO). The Head of Cancer Department recommends screening asymptomatic women aged 30-65 years at nationwide Center for Early Diagnosis, Screening and Education for Cancer (KETEM) using HPC test by 5-years interval and re-assessing positive cases using Pap smear test (2).

In this study, it was aimed to measure level of knowledge about cervical cancer and its causative agent in women presented to KETEM in Konya Teaching and Training Hospital between June, 2015 and October, 2015; to provide education by identifying knowledge gap about causes of cervical cancer and protection strategies; and to evaluate HPV DNA test results.

MATERIALS and METHODS

Research Design, Setting and Sampling

This is an analytic, cross-sectional study. The study sample included 250 women who presented to KETEM in Konya Training and Research Hospital of Health Sciences University for routine screening between July, 2015 and October, 2015 and accepted participation. All participants gave written informed consent in accordance to tenets of Helsinki Declaration

Exclusion Criteria:

- Women aged <30 years
- Coitus or vaginal douching within prior 48 hours
- Vaginal ovule use within prior 7 days
- Non-native Turkish speakers
- Women previously diagnosed as cervical cancer

Data Collection

Data were collected via face-to-face interview technique using a 38-item questionnaire that is prepared based on literature by researchers and includes items on sociodemographic characteristics as well as awareness regarding cervical cancer and HPV. Menarche age; marriage age; whether received sexual education; number of children if present; age at first delivery; menopausal status; whether received hormone replacement therapy if menopausal; menstruation cycles; numbers pregnancies, deliveries, stillbirths or curettage interventions; whether attending regular gynecological examination; and Pap smear test status and frequency were questioned. During interview, detailed information was provided regarding HPV and cervical cancer. In addition, Pap smear results were reviewed to determine HPV prevalence.

Statistical Analysis

Statistical analyses were performed using SPSS version 22.0. Descriptive statistics are presented as frequency and percent for categorical variables while mean and standard deviation for numerical variables. Chi-square test was used to assess relations among categorical variables. All results were presented with 95% confidence interval. A $p < 0.05$ value was considered as statistically significant.

RESULTS

The study included 250 women aged 30 years and older. Mean age was 47.7 ± 7.5 years old (range: 30-66 years old). Of the women included, 92.4% (n=231) were married, 82.8% (n=207) were housewives, 70.4% (n=176) had primary school degree, and 14.4% were smokers while 98.8% (n=247) reported that they received no sexual education at school. Table 1 presents characteristics of study population. When answers to the question "How often do you have gynecological examination" were assessed, 6.8% (n=17) responded as once every 6 months while 14.4% (n=36) as annually, 9.6% (n=24) as every other year, 3.6% (n=9) as once every three years and 5.2% (n=13) as less than once every three years. Of the women, 60.4% (n=151) reported that they don't have regular gynecological examination. When Pap smear results were assessed, it was found that HPV was positive in 3.2% (n=8).

Table 1. Characteristics of subjects (n=250)

		n	%
Age groups	30-39 years old	28	11.2
	40-49 years old	124	49.6
	50-59 years old	75	30.0
	≥60 years old	23	9.2
Marital status	Married	231	92.4
	Single	19	7.6
Occupation	Housewife	207	82.8
	Officer	12	4.8
	Worker	17	6.8
	Retired	14	5.6
Education level	Illiterate	16	6.4
	Primary school	176	70.4
	Secondary school High school	32	12.8
	College	26	10.4
Income	500-1000 TL	93	37.2
	1000-1500 TL	62	24.8
	1500-2000 TL	41	16.4
	≥2000 TL	54	21.6
Sexual education	Received	3	1.2
	Not received	247	98.8
Smoking status	Non-smoker	194	77.6
	Ex-smoker	20	8.0
	Smoker	36	14.4
HPV DNA results	HPV negative	242	96.8
	HPV positive	8	3.2

Table 2 presents mean age at menarche, marriage, first delivery and menopause. Table 3 presents level of knowledge about Pap smear test which is recommended routinely in cervical cancer screening. One-hundred twelve women (44.8%) reported that they know Pap smear test while 143 women (57.2%) previously had Pap smear test and 2 women (0.8%) had pathological Pap smear test results. Only one woman (0.4%) reported that she has heard of HPV and 52 women (20.8%) reported that they have heard of HPV vaccine previously. Table 4 presents level of knowledge about HPV and cervical cancer in the study population. It was found that the knowledge on the facts that multiple sexual partners and younger age at first sexual experience increase risk for cervical cancer was lacking in 53.6% and 80.8% of women included, respectively. Again, 98.0% of women had no knowledge about that they can protect themselves against cervical cancer by vaccine or other preventive measures. The frequencies of having heard or undergoing Pap smear test and having knowledge about HPV vaccine were significantly higher in women with higher educational level compared to those with low educational level ($p < 0.001$). In addition, frequency of having knowledge about HPV vaccine was significantly higher in women with higher income ($p = 0.014$) and among women knowing Pap smear test ($p < 0.001$) (Table 5). The level of knowledge about screening test and Pap smear test frequency were significantly higher in women having regular gynecological examinations ($p < 0.001$).

Table 2. Age at menarche, marriage, first delivery and menopause

	n	Mean \pm SD (Min-Max)*
Menarche age	250	13.1 \pm 1.3 (9-17)
Marriage age	249	19.9 \pm 3.9 (14-41)
First delivery age	237	21.7 \pm 3.8 (14-41)
Menopause age	95	47.3 \pm 4.2 (35-55)

*SD: Standard deviation, Min: Minimum, Max: Maximum

Table 3. Data about screening tests recommended for cervical cancer

	n	%
Knowledge about screening tests		
Accurate	112	44.8
Inaccurate	138	55.2
Pap smear test		
Never had	107	42.8
Once	83	33.2
Twice	25	10.0
Three times	12	4.8
≥ 4 times	23	9.2
First Pap smear test time		
After beginning to have sexual experience/first delivery	27	10.8
30-39 years of age	47	18.8
After 40 years of age	58	23.2
After menopause	12	4.8
I don't know	106	42.4

How often should patients have Pap smear test?

Once every 6 months	28	11.2
Annually	89	35.6
Every other year	22	8.8
Once every three years	5	2.0
Once every five years	19	7.6
I don't know	87	34.8

Pap smear test results

HPV 16	1	0.4
Koilocytosis	1	0.4
Normal	248	99.2

HPV is *

Sexually-transmitted	116	46.4
Transmitted via blood	1	0.4
Transmitted via non-hygienic toilets	3	1.2
I don't know	133	53.2

HPV Knowledge *

It causes cervical cancer	5	2.0
It is transmitted from unfamiliar women	1	0.4
It causes warts	2	0.8
Haven't heard	243	97.2

Do you favor your daughter to have HPV vaccine?

Yes	236	94.4
No	13	5.2
Undecided	1	0.4

* Multiple answers were given

Table 4. HPV and cervical cancer awareness

	Yes, I know		No, I don't know	
	n	%	n	%
Do you know that multiple sex partners increased risk for cervical cancer?	116	46.4	134	53.6
Do you know that younger age at first sexual experience increases risk for cervical cancer?	48	19.2	202	80.8
Do smoking increase risk for cervical cancer?	221	88.4	29	11.6
Do you know that you can protect yourself against cervical cancer by vaccine or other methods?	52	20.8	198	79.2
Do you know the relationship between HPV and cervical cancer?	5	2.0	245	98.0

Table 5. Factors affecting Pap smear and HPV awareness

	Do you know what is Pap smear and HPV?			p
	Yes n (%)	No n (%)	Total n (%)	
Education level				
Illiterate	3 (18.8)	13 (81.2)	16 (6.4)	<0.001
Primary school	70 (39.8)	106 (60.2)	176 (70.4)	
Secondary school/High school	19 (59.4)	13 (40.6)	32 (12.8)	
College	20 (76.9)	6 (23.1)	26 (10.4)	
Knowledge about screening tests				
Accurate	69 (61.6)	43 (38.4)	112 (44.8)	<0.001
Inaccurate	43 (31.2)	95 (68.8)	138 (55.2)	
Knowledge about HPV				
Accurate	37 (71.2)	15 (28.8)	52 (20.8)	<0.001
Inaccurate	75 (37.9)	123(62.1)	198(79.2)	
Income level (monthly)				
500-1000 TL	17 (18.3)	76 (81.7)	93 (37.2)	0.014
1000-1500 TL	5 (8.1)	57 (91.9)	62 (24.8)	
1500-2000 TL	13 (31.7)	28 (68.3)	41 (16.4)	
≥2000 TL	17 (31.5)	37 (68.5)	54 (21.6)	

DISCUSSION

The Human papilloma virus infection, major cause of cervical cancer, generally resolves spontaneously; however, recovery may be incomplete in some cases and prolonged infection can cause development of precancerous lesion in the relevant region (8,10,11). According to 2013 data, 1686 women are diagnosed as cervical cancer and 663 women die due to cervical cancer annually. The risk factors for cervical cancer includes age at first sexual experience (<18 years old), multiple sex partners, smoking, ethnicity, high parity, low socioeconomic level, HPV positivity and other sexually-transmitted diseases (4,5,8). It was aimed to screen each women using HPV test by 5-years intervals and to assess positive cases using Pap smear test, according to "Revised National Cancer Screening Standards 2012" in Turkey (2). It has been observed that cervical cancer incidence and mortality was decreased in regions implementing an active screening program in the world (12). There are many studies on cervical cancer and screening in the literature. It is seen that there are some differences regarding knowledge about Pap smear test and HPV vaccine among different countries and ethnical groups. In the multicenter "The Prevalence of Cervical Cancer Screening in 57 Countries" by Gakidou et al., the screening prevalence is above 80% in countries such as Austria and Luxembourg while below 1% in those such as Bangladesh, Ethiopia and Myanmar (13). The rate reached up to 82.6% in Turkey, indicating that Turkey is at level of developed countries (14).

Smoking is a major public health issue and an important risk factor for cervical cancer. Based on Global Adult Tobacco Survey, smoking rate was 31.2% in Turkey in

2016. The smoking rate is higher among men (44.1%) than women (19.2%) (15). In our study, 14.4% of women included were active smokers.

In the literature, there are many studies on HPV prevalence which shows marked variations across world. In a meta-analysis "Cervical Human Papillomavirus Prevalence in 5 Continents" including 194 studies (approximately 1 million women, Bruni et al. reported HPV prevalence as 11.7% worldwide whereas 24.0% in Sub-Saharan Africa, 16.1% in Latin America and Caribbean, 14.2% in Eastern Europe and 9.4% in Southeastern Asia. In addition, HPV prevalence showed a heterogeneous distribution within countries. For instance, HPV prevalence varied from 2.9% to 80% in 19 studies from USA included to meta-analysis. The heterogeneity was attributed to differences in age, ethnicity, risk factors and study population among studies (16). The HPV prevalence was reported as 2.4% in a study conducted on 4243 women in KETEM at Van province while Dursun et al. reported HPV prevalence as 23.0% in 507 women (11,17). In our study, HPV prevalence was estimated as 3.2%. The difference between our results and those reported by Dursun et al. or consistent results in our study and Van study can be due to difference in study design such as population-based or hospital based study protocols.

In a study on 451 women presented to Gynecology & Obstetrics outpatient clinic, the educational level was primary school in 61.8% and secondary school or higher in 38.2% while 43.7% were having regular gynecological examination in the study (18). In our study, only 39.6% of women were having regular gynecological examination. The low rate in our study may be explained by low educational level which was found as primary school or lower in 76.8% of participants.

The rate of women who were familiar to Pap smear tests was 51.8% in a study on 336 women presented to Gynecology & Obstetrics outpatient clinic whereas 92.5% in an Argentinian study including 200 women, 25.8% in a study on 543 women by Kurtipek et al. 53.8% in a Saudi Arabian study including 507 women, 75.7% in a study on 966 patients presented to gynecology outpatient clinic by Aydin et al. (19-22). In our study, 44.8% of individuals had accurate information about screening tests recommended routinely for cervical cancer. Again, the rate of women who had at least one Pap smear test was 16.9% in a study including 543 women, 24.9% in Saudi Arabian study including 507 women and 63.8% in the study on 966 patients presented to Gynecology & Obstetrics outpatient clinic by Aydin et al. (19,21,22). It was 57.2% in our study. The difference between our study and literature may be due to education and income levels of participants.

In a study on 294 women from Ankara province, the gynecological examination frequency was significantly correlated with having Pap smear test and HPV awareness (23). In agreement with literature, there was a significant relation with gynecological examination frequency and level of knowledge about Pap smear or having had Pap smear. The women might have undergone Pap smear test routinely performed in Gynecology & Obstetrics outpatient clinics even if they presented for reasons other than screening.

In a study on 400 parents, 41.3% reported that they have heard of HPV while 36.5% reported that they have heard of HPV vaccine (24). In a study on 294 women from Ankara province, 24.5% and 28.2% of participants reported that they have heard of HPV and HPV vaccine, respectively (23). In our study, 97.2% reported that they have never heard of HPV while 20.8% were aware of HPV vaccine. The lower frequency of having heard of HPV in our study may be due to low educational level of participants.

In a study by Pinar et al., 48.4% of participants know that multiple sex partners are risk for cervical cancer while this rate was 78.4% in a study on 900 women in Uganda (25, 26). Again, in the study from Uganda, 73.9% of participants know that younger age at first sexual experience is a risk factor for cervical cancer (26). In our study, 46.4% and 19.2% of participants had knowledge that multiple sex partners and younger age first sexual experience are risk factors for cervical cancer. The difference in the results may be due to differences in ethnicity, religious beliefs and education level of participants across studies.

In a study on 230 nurse in Ankara, 77.6% of participants know that smoking (10 cigarettes/day and over) is a risk factor for cervical cancer while this rate was 85.8% in study on 148 female academicians in Sivas (27,28). In a North Indian study on females of rural and urban areas of Haryana, 21.75% of participants in rural areas and 28.0% of participants in urban areas know that smoking is risk for cervical cancer (29). This rate was 88.4% in our study. Tobacco control activities are highly effective in Turkey and people are mostly aware of its negative impact on health (30).

In a Korean study on adolescent girls and their mothers, 51.0% of mothers know relationship between HPV and cervical cancer while this rate was 34.5% in a population-based Nigerian study including 290 subjects, 40% in a Turkish study including 1434 women from 4 provinces and 50% in a US study on HIV positive women (11,31-33). In our study, only 2% of women know that HPV leads cervical cancer. This rate is extremely lower when compared to literature. This may be due to population-based design and higher proportion of participants with education level of primary school or lower in our study. In a study on 543 women by Kurtipek et al., no significant correlation was found between education level and knowledge about vaginal smear test while significant correlations were detected between having had vaginal smear and education, marital status and age (21).

In a Nigerian study on 198 women, a significant correlation was found between level of knowledge about Pap smear test and education level (34). In our study, there was a significant relation between education level and knowledge about Pap smear test or having Pap smear test. We concluded that women with higher education level are more informed and willing to have Pap smear test for early diagnosis of cervical cancer.

In a study on 451 women presented to gynecology outpatient clinic, Gorkem et al. reported that women with higher education and income level were more familiar to HPV vaccination (18). In another study on 336 women presented to Gynecology & Obstetrics outpatient clinic, no significant difference was detected between education levels and HPV vaccine knowledge (35). In an Abu-Dhabi study on 400 parents, there was no significant correlation between education levels and being aware of HPV vaccine (24). In our study, HPV vaccine knowledge was increased by higher education and income levels. In addition, HPV purchasing rates were also increased by higher income level in our study. The higher income level improves access to private healthcare services and data sources such as internet. This may lead higher rates of HPV and HPV vaccine awareness among women with high income levels.

CONCLUSION

In conclusion, it was demonstrated that besides Pap smear test rates, awareness and knowledge regarding HPV, cervical cancer and HPV vaccine were very low in our study. It is possible to reduce disorders caused by HPV infection and cervical cancer incidence by improving awareness for cervical cancer and HPV infection, generalizing use of preventive measures, and extending participation to screening programs and HPV vaccination. It is important to enhance recognition of cervical cancer, which is within first ten among woman cancers, and implementing population-based screening programs in prevention of cervical cancer. In this context, Turkish Health Ministry is carrying out cervical cancer screening program in addition to some other cancer types through KETEM. As similar to in many health-related

problems, protection against cervical cancer is possible by achieving a conscious sensitivity across community and implementing a robust primary healthcare serves in the country.

Competing Interests: The authors declare that they have no competing interest.

Financial Disclosure: There are no financial supports.

Ethical Approval: The study was approved by Ethics Committee of Necmettin Erbakan University Meram Medical Faculty (2015/380-18.12.2015).

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